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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NATNAEL, PAULOS M	

ART UNIT	PAPER NUMBER
2614	8

DATE MAILED: 07/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/923,920	MCDONALD, DAVID C.	
	Examiner	Art Unit	
	Paulos M. Natnael	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims **1-6** are rejected under 35 U.S.C. 102(e) as being anticipated by Pattitt et al. U.S. Pat. No. 6,256,073.

Considering claim **1**, Pattitt discloses all claimed subject matter, note;

a) a segmented color wheel having four segments..., is met by color wheel 400, fig.4;

b) the claimed three of the segments being primarily transmissive in only a portion of the wavelength spectrum of visible light, the portion for each of the three segments not being identical, is met by segments 402-408 which are not identical.

c) one of the segments being broadly transmissive across the wavelength spectrum of visible light, the broadly-transmissive segment having a transmittance that is not uniform across the wavelength spectrum of visible light so as to provide a desired color of light transmitted therethrough, is met by the disclosure in Table 1, which illustrates a transmittance that is not uniform for the blue, green (short & long wave) and red color segments.

d) a base to which the color wheel is rotatably mounted, is inherent because the color wheel 400 is rotating color wheel and has to be mounted somewhere

Considering claim **2, a** color sequencing system as defined in claim 1, wherein the color sequencing system is optimized for use with a particular light source by selecting the transmittance of the broadly-transmissive segment so as to provide a substantially uniform light output after the light from the light source has passed through the broadly-transmissive segment.

See rejection of claim 1(c).

Considering claim 3, a color sequencing system as defined in claim 2, wherein the spectral transmittance of the broadly-transmissive segment is substantially the inverse of the spectral light output from the light source, is **inherent** because when the light is non-uniform the sequencer tends to attenuate some of the light.

Considering claim 4, a color sequencing system as defined in claim 1, wherein the spectral transmittance of the broadly-transmissive segment is attenuated in some portion of the wavelength spectrum of visible light;

See rejection of claim 1(c).

Considering claim 5, a color sequencing system as defined in claim 1, wherein the spectral transmittance of the broadly-transmissive segment is notched in some portion of the wavelength spectrum of visible light.

See rejection of claim 1

Considering claim 6, a color sequencing system as defined in claim 1, wherein the three segments transmit light that is primarily red, green, and blue, respectively, is met by the four segments which transmit light that is red, green (shortwave and longwave) and blue. (see Table 1)

3. Claims **7-17**are rejected under 35 U.S.C. 102(e) as being anticipated by Sharp et al., U.S. Pat. No. 6,417,892.

Considering claim 7, Sharp et al. disclose the following claimed subject matter, note;

a) providing a light source, a color sequencer, and a spatial light modulator, is met by light source 1500, the CSLM color sequencer 1550, and the display screen 1590, **fig.46**

b) providing light of primarily one color band from the combination of the light source and the color sequencer while the spatial light modulator displays an image corresponding to that color band, is met by sequential color display, fig.46. (see col. 10, lines 46-57 and col. 45, lines 25-32)

c) providing light of primarily a second color band from the combination of the light source and the color sequencer while the spatial light modulator displays an image corresponding to that second color band, is met by sequential color display, fig.46; (see col. 10, lines 46-57 and col. 45, lines 25-32)

d) providing light of primarily a third color band from the combination of the light source and the color sequencer while the spatial light modulator displays an image corresponding to that **third** color band, is met by sequential color display, fig.46. (see col. 10, lines 46-57 and col. 45, lines 25-**32)**

e) providing spectrally-broad light from the combination of the light source and the color sequencer while the spatial light modulator displays an image corresponding to that spectrally-broad light, wherein the spectrally-broad light has desired spectral characteristics as a result of the combination of the light

source and the color sequencer, is met by the disclosure "the light source 1500 and the sequencer 1550 sequentially illuminate the liquid crystal display 1560 with red, green and blue light. The liquid crystal display 1560 is sequentially driven with red, green and blue image information in synchronism with the red, green and blue illumination from the light source 1500 and the color sequencer 1550. The liquid crystal display 1560, in combination with the polarizer 1570, modulates the intensity of the light that is sent to the screen 1590 in accordance with the image information. (col. 45, lines 25-35)

Considering claim **8**, a method as defined in claim 7, wherein the light source provides light that is substantially non-uniform spectrally and the color sequencer has a corresponding transmittance that is substantially non-uniform spectrally, is met by light source 1500 and color sequencer 1550, fig.46;

Considering claim **9**, a method as defined in claim 8, wherein the corresponding transmittance is attenuated in spectral regions where the light from the light source is elevated, is met by the disclosure in fig. 34A.

Considering claim **10**, a method as defined in claim 7, wherein the non-uniformities of the light from the light source and the corresponding transmittance from the color sequencer are inversely related, is **inherent** because when the light is non-uniform the sequencer tends to attenuate some of the light.

Considering claim **11**, a method as defined in claim 7, wherein the images to be displayed are based on input data, and wherein the displayed image corresponding to the spectrally-broad light is derived from the input data and the displayed images corresponding to each color band are adjusted accordingly, is met by the disclosure that "In sequential color techniques, sub-frames are displayed, with each sub-frame comprising the distribution of an additive primary color in a full-color image. By displaying the sub-frames at a sufficient rate, e.g., three-times the video rate, or 180 Hz, the eye integrates the sub-frames temporally, yielding a perceived full-color image. In this case, each pixel provides full-color because there is no spatial subdivision. In principle, a full-color pixel using a CFA provides the same brightness as a sequential pixel of the same area. However, neither makes efficient use of light, because displaying an additive primary color generally means blocking the complementary subtractive primary." Col. 1, lines 39-50.

Considering claim **12**, a method as defined in claim 10, wherein the spatial light modulator is pixellated and the input data is provided in frames of data specifying the color and brightness for each pixel of the spatial light modulator for each frame, and wherein for each frame a spectrally-broad component is derived from the color and brightness information and this spectrally-broad component is used to create the displayed image corresponding to the spectrally-broad light, is met by the disclosure that "most of the CSLM designs discussed above allow the modulators in each of the CSLM stages to be pixellated, in order to permit

common-path full color displays using video rate panels. A few of the CSLM designs discussed above are intended specifically for either additive primary or subtractive primary color generation only." (col. 27, 17-23)

Considering claim **13**, a method as defined in claim 7, wherein the color sequencer includes a color wheel, is met by the disclosure that "While the CCS of FIGS. 22A and 22B can be operated in a cyclic R, G, B mode, which mimics the function of a rotating color filter wheel, it is capable of much more." (col. 31, 1-3)

Considering claim 14, a method as defined in claim 13, wherein the color wheel includes a broadly transmissive segment with non-uniform spectral transmittance.

See rejection of claim 13;

Considering claim 15, a method as defined in claim 7, wherein the color sequencer includes birefringent liquid crystal materials that can be controlled to produce light of any combination of at least three different color bands, is met by the disclosure that "Other useful materials for increasing view angle are negative **birefringent** films with optic axes oriented along z..." (col. 39, 20-25)

Considering claim 16, a method as defined in claim 15, wherein the spectrally-broad light is provided from the color sequencer by combining light from each of the three color bands.

See rejection of claim 7(e).

Considering claim 17, a method as defined in claim 16, wherein the particular spectral characteristics of the spectrally-broad light is achieved by controlling one or both of the amplitude and time duration of light from a particular color band, is met by the disclosure that "In a subtractive mode, each additive primary is generated via the cooperative action of two stages, each blocking one additive primary. When the blocked additive primaries are adjacent primaries, there is typically an unwanted leakage. More significantly, a dense black state is obtained by subtracting all three additive primaries from white, including any interprimary light. This represents a difficult spectral management problem, because contrast ratios can plummet with even small side lobe amplitudes." (col. 2, lines 50-58)

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Doany et al. U.S. Patent No. 6,309,071 discloses liquid crystal projection display system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paulos M. Natnael whose telephone number is (703) 305-0019. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PMN
July 12, 2004

PAULOS M. NATNAEL
PATENT EXAMINER